Traffic Signal Automation using Spike Road Block.

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ABSTRACT

Generally we observe on the traffic signal, people violet the rule of traffic signal and create a disturbance and daze at signal point which create traffic, causes accident. To overcome this problem we provided a road blocker, which stop the vehicle on respective path depend upon traffic signal and stop the violation of traffic signal rule. To minimize or control the speed of vehicles we provided speed breaker from this speed breaker we generate Barricade by using mechanism .This generated Barricade we can used for operating the road blocker, this road blocker are operated on timing sensor. Also we provide the separate entry gate for emergency situation such as ambulance, government class one vehicles etc. There is need of road safety to control the accidents ratio of the vehicles by using speed breakers. There is tremendous vehicular growth in year by year. Due to the growth of motor vehicles in India during last 4-5 years because of that Traffic is increasing day by day. So there is necessary to built a speed breakers on road to control the traffic and speed of vehicles . For this purpose we need to innovate a device which can manipulates the energy of vehicles that is wasted on speed breakers to some useful work.

Keywords
Speed Breaker, Spike, traffic monitoring, signal automation, alert generation system.

1. INTRODUCTION

The traffic congestion problems are increasing day by day because of the increasing number of vehicles with limited infrastructure. Under this situation, the existing traffic light systems which are timer based are not able to control traffic. TO overcome this barrier, a real time traffic control and monitoring system by using speed block. For effective traffic management and signal control, it's important to know road traffic density. Based on this density value time delay of signals can be set up dynamically. The traffic signal was first discovered in 1912 by a Detroit policeman named Lester Wire like two colour, red-and-green light with a buzzer to warn pedestrians ahead of the impending transition. After that, in 1920, this basic design was updated by William Potts to include the tri-colored red, yellow, and green lights widely used today. This simple, three-color icon has allowed for nearly a century with little change, using modern technologies such as automatic timers, diode lights and motion sensors. Traffic signals are mainly developed to ensure the correct flow of traffic, provide an opportunity for pedestrians or vehicles to cross a junction and help to reduce the number of collisions between vehicles entering intersections from opposite directions.

1.1 Motivation Of System

The existing traffic signal system is implemented with delays where the signal transition time slots are fixed and do not depend on current traffic flow. The existing traffic system needs to be upgraded to solve the severe traffic congestion problems. So here we propose a simple, low-cost, and real time traffic signal system that aims to overcome many problems and improves the traffic system. The system is based on PIC microcontroller that evaluates the traffic density using IR sensors mounted on either sides of each road and dynamic timing slots with different levels. Our system will be very useful for solving most of the traffic congestion problems occurs today.

1.2 Related Work

The „Automated signal Detection & Gate Control” System can be explained by taking the hospital model as follows: The signal Detector stage is having a PC/Microcontroller device with MONITOR/LCD screen, which is connected with the receiver and the software to run signal Detection & Gate Control System. To implement this System we will take details and readings of signal if signal is green we will control road blocker automatically and shut the gate, if the signal is red it will increase the blocker properly and block the signal. In manual controlling of traffic, as the name indicates man power is required to control the traffic. In manual controlling traffic police are required to control the traffic. The traffic police use sign board, sign light and whistle to control the traffic. As the traffic density increases the manpower required to control the traffic too increases in manual controlling system. Since the strength of traffic police is poor compared to the traffic density in our country, it is not possible to control the traffic manually all the area of a city or town.

1.3 Problem Definition and Objective

1.3.1 Problem Definition

To overcome the problem of breaking traffic signals we provided a road blocker, which stop the vehicle on respective path depend upon traffic signal and stop the violation of traffic signal rule. To minimize accidents and traffic congestion the road blocker using IOT mechanism is been implemented. The signal status changes automatically with the timing of the traffic and delay is provided with the help of microcontroller. When the signal is red the interfaced barrier gate closes the spikes open up and a buzzer notifies the closing of gate, thereby blocking the traffic but when the signal is green the same barrier opens and allows a proper
flow of vehicles to avoid traffic jam. The density of traffic is detected using IR sensor and the output is given to the microcontroller for timing change of the signal, and buzzer action. In front of the barrier gate a stop line is drawn and with the help of another IR sensor, the vehicle is tracked whenever it crosses the stop line.

1.3.2 Objective

- To stop the violation of traffic signal rule.
- To avoid accident and traffic at signal point.
- Fast Alert System to near police stations.
- To provide option for ambulance.

2. LITERATURE REVIEW

A Smart Traffic Management System for Congestion Control And Warings. [1] Published year : 2017 Author : Sundaram M, Swamy N.

Traffic congestion is a major problem in many cities of India along with other countries. Failure of signals, poor law enforcement and bad traffic management has lead to traffic congestion. One of the major problems with Indian cities is that the existing infrastructure cannot be expanded more, and thus the only option available is better management of the traffic. Traffic congestion has a negative impact on economy, the environment and the overall quality of life. Hence it is high time to effectively manage the traffic congestion problem. There are various methods available for traffic management such as video data analysis, infrared sensors, inductive loop detection, wireless sensor network, etc. All these methods are effective methods of smart traffic management. But the problem with these systems is that the installation time, the cost incurred for the installation and maintenance of the system is very high. Hence a new technology called Radio Frequency Identification (RFID) is introduced which can be coupled with the existing signaling system that can act as a key to smart traffic management in real time. This new technology which will require less time for installation with lesser costs as compared to other methods of traffic congestion management.

IOT Based Smart Transportation System. [2] Published year :2015 Author: J.Sherly1 ,D.Somasundareswari

Internet of Things (IoT) links the objects of the real world to the virtual world, and enables anytime, anywhere connectivity for anything that has an ON and OFF switch. It constitutes to a world where physical objects and living beings, as well as virtual data and environments, interact with each other. Large amount of data is generated as large number of devices are connected to the internet. So this large amount of data has to be controlled and converted to useful information in order to develop efficient systems. In this paper, we focus on to an urban IoT system that is used to build intelligent transportation system (ITS). IoT based intelligent transportation systems are designed to support the Smart City vision, which aims at employing the advanced and powerful communication technologies for the administration of the city and the citizens.

IOT Based Dynamic Road Traffic Management. [3] Published year : 2015 Author : Misbahuddin.S, Zubairi.A, Basuni.J .All metropolitan cities face traffic congestion problems especially in the downtown areas. Normal cities can be transformed into “smart cities” by exploiting the information and communication technologies (ICT). The paradigm of Internet of Thing (IoT) can play an important role in realization of smart cities. This paper proposes an IoT based traffic management solutions for smart cities where traffic flow can be dynamically controlled by onsite traffic officers through their smart phones or can be centrally monitored or controlled through Internet. We have used the example of the holy city of Makkah Saudi Arabia, where the traffic behavior changes dynamically due to the continuous visitation of the pilgrims throughout the year. Therefore, Makkah city requires special traffic controlling algorithms other than the prevailing traffic control systems. However the scheme proposed is general and can be used in any Metropolitan city without the loss of generality.

3. SYSTEM ARCHITECTURE

3.1. Traffic Light Controller

In this approach, traffic light will be monitor and controlled by our system. System will monitor our traffic light flow and send command or status to hardware.

3.2. Command Hardware

After detection of signal status the system will command hardware to start or stop motor.

3.3. Extract Signal and Hardware Status

To detect status of signal and send command to arduino which will in turn turn hardware motor on off.
3.4 Increase Spikes Using Relay Motor
To command hardware based on hardware command which will increase spikes and decrease spikes. In additional it will also retrieve data from database.

3.5 Data Retrieval
Based on IR sensor return status system will retrieve data value of near police RTO from database and will generate alert.

4. METHODOLOGY
This project has main three parts viz. Signal Light detection and Detecting signal jump status, Command hardware relay, Extract near police and sending alert.
To detect a signal jump, sensor values used. It will work only when RED signal is ON. The logic of using IR sensor here is that, whenever a person breaks the signal, he/she will come in range of the IR sensor and this will turn it ON. The signal will be sent to microcontroller and it will turn the Camera ON. Now, system will click the picture vehicle. Also, if anyone stops the vehicle on the zebra crossing, then it will be considered as a signal jump. This is done to prevent people from stopping on zebra crossings. The research work divides into the following Phases:

- Research: To do a complete automation of signal spike and speed breaker control.
- Desktop Application:
  - To collect the signal data based on status and light data
  - To monitor speed breaker values and status.
- Spike Controllers:
  - Control spike and motor.
  - Monitor the status of the signal.

5. APPLICATION
- Traffic Signals
- Railway Barriers
- Prohibited Areas
- Security Zones

CONCLUSION
We conclude that The road spike system is used for various application according to condition like controlling traffic management ,BRT system, one way road direction this ensure to obey traffic rules properly. By using this system the count of accident happened be reduces.

REFERENCES